

## ABSTRACT

A low-cost, portable, strap-down, navigation system including: an Inertial Navigation System (INS); a GPS receiver; and a 3-Axis Magnetometer (MAG). A microprocessor controls and filters the data from the INS, GPS and MAG. In a preferred embodiment the system provides an indication of: True Heading; 3-D Position; 3-D Velocity; 3-D Acceleration; 3-D Attitude; and 3-D Angular Rate. A filter weighs the trustworthiness of each sensor, favoring the GPS and MAG sensors for relatively low rate movements and steady state conditions and the INS sensors for transient movements.

fig. 1 MAGAL Block D: